ATTACHMENT A

Clean Replacement/New Claims (entire set of pending claims)

Following herewith is a clean copy of the entire set of pending claims.

1. A grating structure in an optical waveguide, the grating structure being composed of a material having a refractive index variation and the grating structure comprising different order gratings superimposed.

2. The grating structure as claimed in claim 1, wherein the grating structure comprises a first order grating and a second order grating superimposed.

3. (amended) The grating structure as claimed in claim 1, wherein at least one of the different order gratings is chirped.

4. (amended) The grating structure as claimed in claim 1, wherein at least one of the different order gratings is sampled.

5. (amended) The grating structure as claimed in claim 1, wherein at least one of the different order gratings is apodised.

6. (amended) An optical filter in an optical waveguide, the filter comprising the grating structure as claimed in claim 1.

7. An filter as claimed in claim 6, wherein the filter comprises a chirped second order grating superimposed on a first order grating, the second order grating transmitting, in use, predetermined wavelengths of light energy substantially perpendicular to a core axis of the waveguide and at predetermined positions along the waveguide.

92 8. (amended) An optical free space coupler in an optical waveguide, the coupler comprising a first grating structure as claimed in claim 1.

9. A coupler as claimed in claim 8, wherein the first grating structure is formed within a first optical waveguide and is arranged to provide the emission of filtered light energy substantially perpendicular to a core axis of the first waveguide; and a second grating structure formed within a second optical waveguide placed in the path of emission of the filtered light energy can couple a filtered light energy substantially perpendicular to a core axis of the first waveguide; and a second grating structure formed within a second optical waveguide placed in the path of emission of the filtered light energy can couple a portion of the filtered light energy along the second optical waveguide.

10. A coupler as claimed in claim 9, wherein at least one of the first or second grating structures comprises a first order grating and a second order grating superimposed.

11. An optical sensor in an optical waveguide, the sensor comprising the grating structure as claimed in claim 1.

12. A sensor as claimed in claim 11, wherein the grating structure comprises a second order grating superimposed on a first order grating formed within an optical waveguide, the grating structure having a predetermined second order modulation so as to provide for the reciprocal emission of optical energy substantially perpendicular to the optical waveguide; the sensor further comprising an optically sensitive material spaced adjacent to the optical waveguide, the material having optical reflective properties variable in accordance with an external physical parameter, the material reflecting the emitted optical energy from the grating structure back to the grating structure.

13. (amended) A device for suppressing ripples in a dispersion compensator in an optical fiber, the device comprising the grating structure as claimed in claim 1 for providing an optical loss mechanism to effect the suppressing of the ripples.

14. (amended) A dispersion compensator for compensating dispersion in an optical fiber, the compensator comprising the grating structure as claimed in claim 1 for providing an optical loss mechanism for suppressing ripples.

ATTACHMENT B

Marked Up Replacement Claims

Following herewith is a marked up copy of each rewritten claim together with all other pending claims.

1. A grating structure in an optical waveguide, the grating structure being composed of a material having a refractive index variation and the grating structure comprising different order gratings superimposed.

2. The grating structure as claimed in claim 1, wherein the grating structure comprises a first order grating and a second order grating superimposed.

3. (amended) The grating structure as claimed in claim~~s~~ 1 ~~or 2~~, wherein at least one of the different order gratings is chirped.

4. (amended) The grating structure as claimed in ~~any one of the preceding claims~~ claim 1, wherein at least one of the different order gratings is sampled.

5. (amended) The grating structure as claimed in ~~any one of the preceding claims~~ claim 1, wherein at least one of the different order gratings is apodised.

6. (amended) An optical filter in an optical waveguide, the filter comprising the grating structure as claimed in ~~any one of claims 1 to 5~~ claim 1.

7. An filter as claimed in claim 6, wherein the filter comprises a chirped second order grating superimposed on a first order grating, the second order grating transmitting, in use, predetermined wavelengths of light energy substantially perpendicular to a core axis of the waveguide and at predetermined positions along the waveguide.

8. (amended) An optical free space coupler in an optical waveguide, the coupler comprising a first grating structure as claimed in ~~any one of claims 1 to 5~~ claim 1.

9. A coupler as claimed in claim 8, wherein the first grating structure is formed within a first optical waveguide and is arranged to provide the emission of filtered light energy substantially perpendicular to a core axis of the first waveguide; and a second grating structure formed within a second optical waveguide placed in the path of emission of the filtered light energy can couple a filtered light energy substantially perpendicular to a core axis of the first waveguide; and a second grating structure formed within a second optical waveguide placed in the path of emission of the filtered light energy can couple a portion of the filtered light energy along the second optical waveguide.

10. A coupler as claimed in claim 9, wherein at least one of the first or second grating structures comprises a first order grating and a second order grating superimposed.

11. An optical sensor in an optical waveguide, the sensor comprising the grating structure as claimed in claim 1.

12. A sensor as claimed in claim 11, wherein the grating structure comprises a second order grating superimposed on a first order grating formed within an optical waveguide, the grating structure having a predetermined second order modulation so as to provide for the reciprocal emission of optical energy substantially perpendicular to the optical waveguide; the sensor further comprising an optically sensitive material spaced adjacent to the optical waveguide, the material having optical reflective properties variable in accordance with an external physical parameter, the material reflecting the emitted optical energy from the grating structure back to the grating structure.

13. (amended) A device for suppressing ripples in a dispersion compensator in an optical ~~fibre~~fiber, the device comprising the grating structure as claimed in claim 1 for providing an optical loss mechanism to effect the suppressing of the ripples.

14. (amended) A dispersion compensator for compensating dispersion in an optical ~~fibre~~fiber, the compensator comprising the grating structure as claimed in claim 1 for providing an optical loss mechanism for suppressing ripples.